

Goddard's Geophysical and Astronomical Observatory (GGAO)



GGAO is located 3 miles from Goddard, on Springfield Road, in the middle of the Beltsville Agricultural Research Center.

GGAO is home to NASA's Satellite Laser Ranging (SLR). Developed at Goddard in the early 1960s as a very accurate tracking technique for satellites carrying retro-reflectors, SLR is now practiced in over 30 countries. NASA belongs to the International Laser Ranging Service (<http://ilrs.gsfc.nasa.gov>) which is an organization that includes SLR stations and analysis centers around the world, and supports the global data collection and analysis of the SLR data. Products are used in support of geodetic and geophysical research and supplied to the International Earth Rotation Service in support of the International Terrestrial Reference Frame.

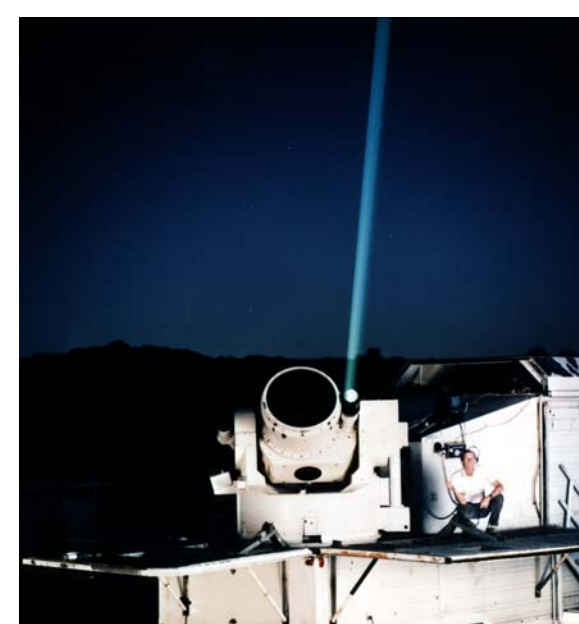
GGAO is one of the few sites in the world to have all four geodetic techniques collocated: SLR, Very Long Baseline Interferometry (VLBI), Global Navigational Satellite System (GNSS), and Doppler Orbitography and Radio-positioning Integrated by Satellite (DORIS). Code 698 is the Goddard organization responsible for VLBI, GPS and DORIS. SLR operations activity is in code 453 with the R&D work in 694.

Other activities at GGAO include the code 662 X-Ray beam-line, the code 695 low frequency interferometry, the Astronomy Club's telescope facility, and many others.

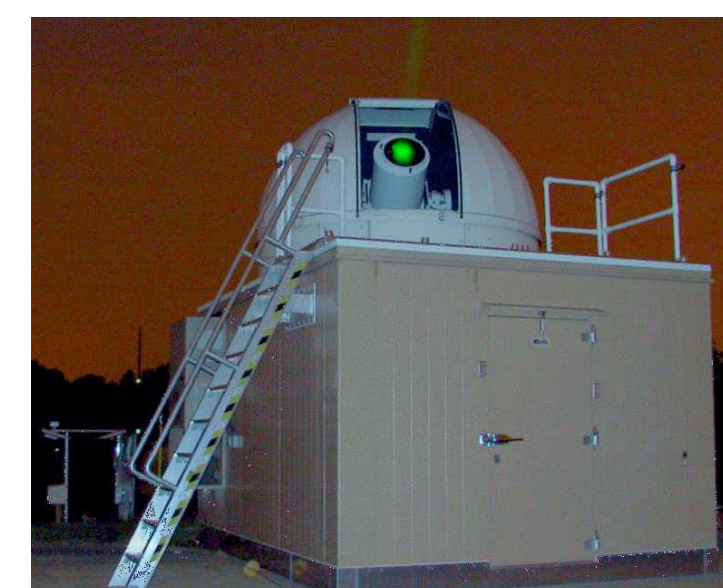
Contact Jan McGarry/694 (Jan.McGarry@nasa.gov) or Mike Perry/694 (Mike.Perry@Honeywell.com) for more information.



SLR PAST:
GODLAS: 1964



SLR PRESENT:
MOBLAS-7 built 1978
and still operating

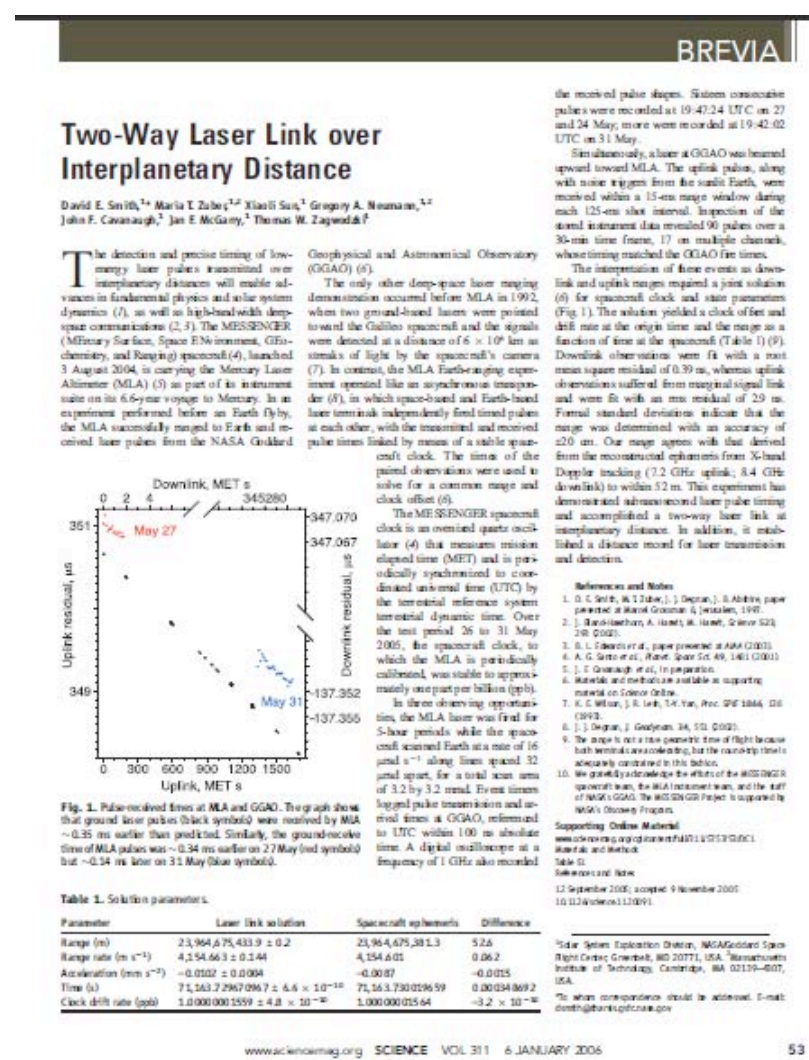


SLR FUTURE:
NGSLR: prototype
in final development

SLR R&D (694) at GGAO includes development of NASA's Next Generation Satellite Laser Ranging System (NGSLR) and in-cruise / on-orbit calibration of altimetric satellites.

In 2005 a successful laser uplink and downlink with the Mercury Laser Altimeter (MLA) onboard the Messenger spacecraft was performed at 24 Mkm.

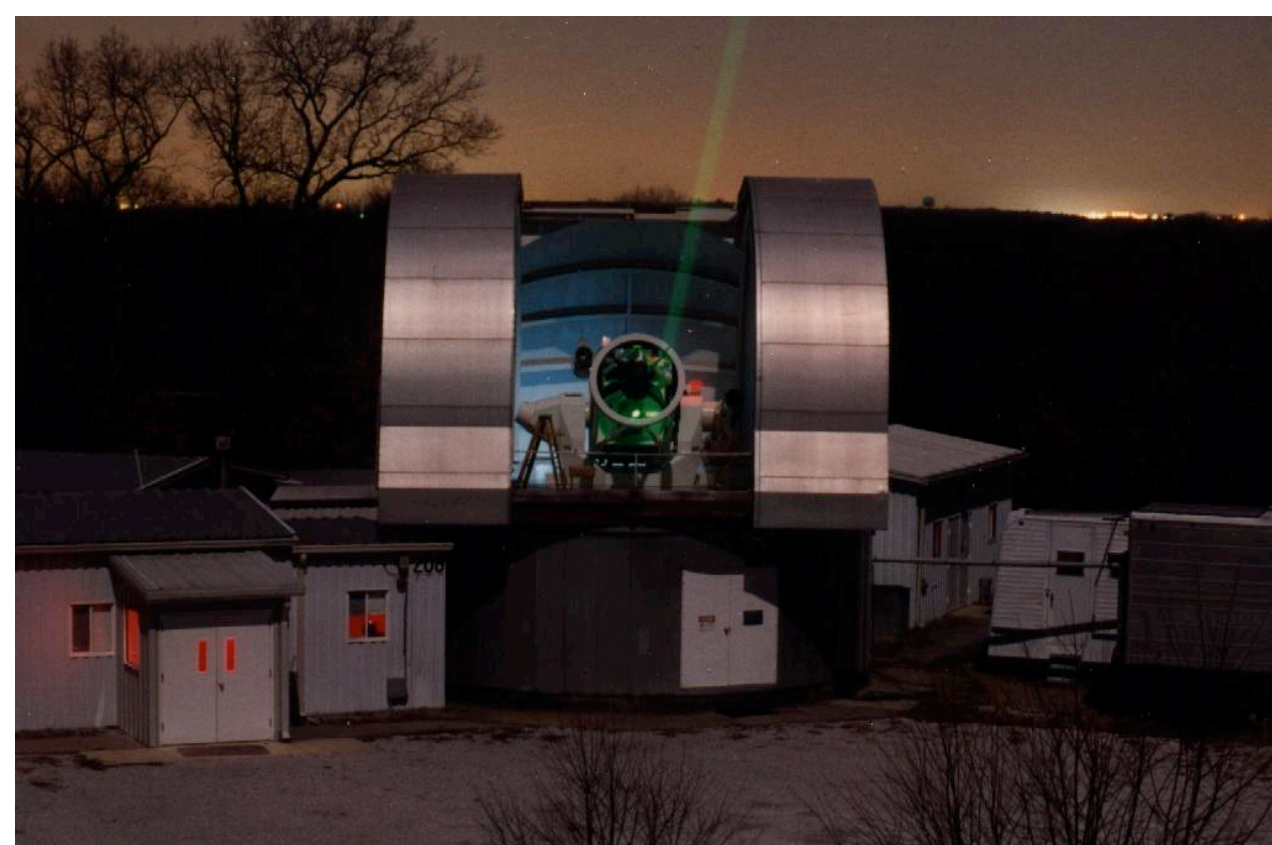
Also that year a laser uplink to MOLA orbiting Mars was performed at a distance of 80 Mkm. Both were from the 1.2 meter telescope facility.



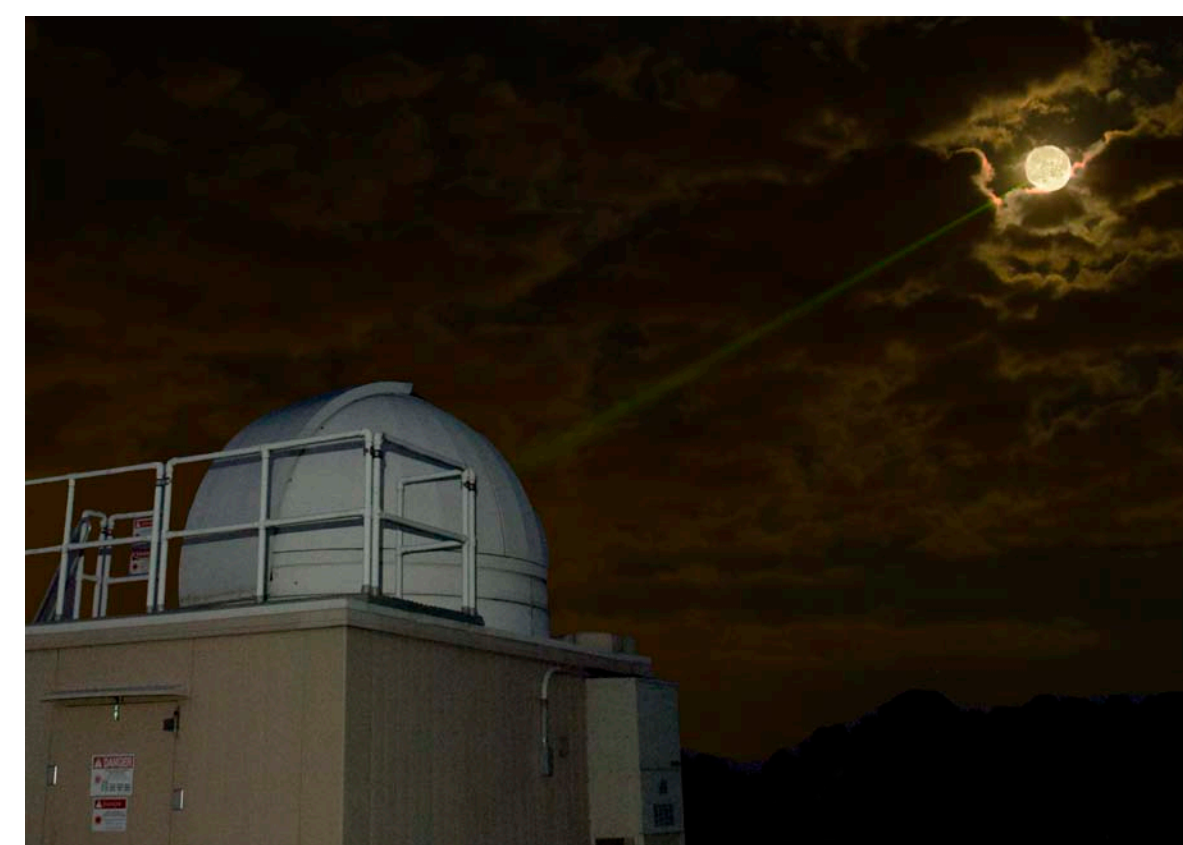
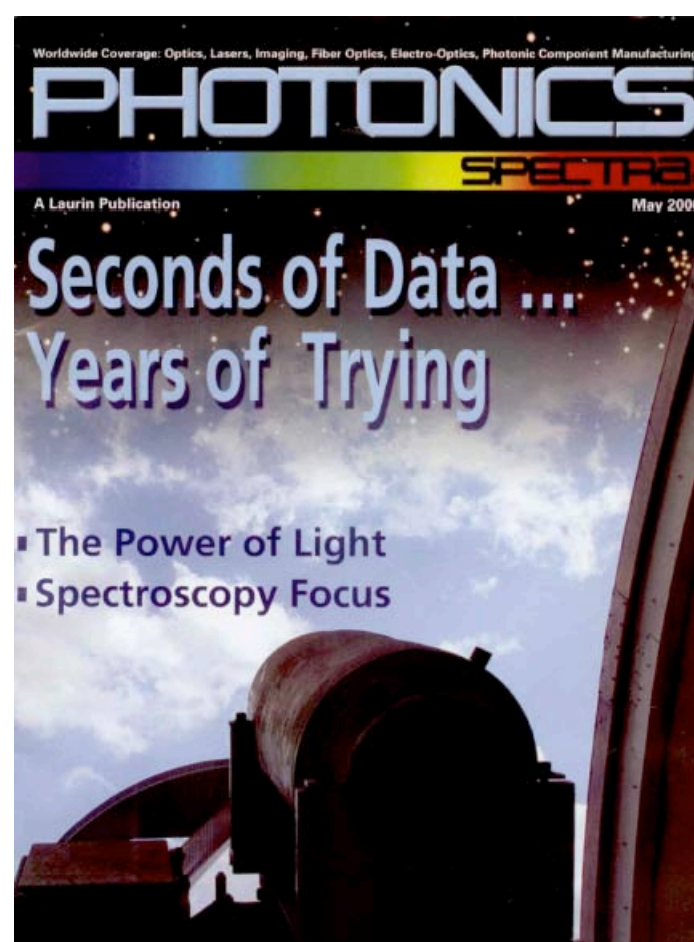
THE FUTURE AT GGAO:

NGSLR will range to the Lunar Reconnaissance Orbiter (LRO) for the next year (uplink only) to provide more accurate orbital information.

The 1.2 meter telescope will be used to perform on-orbit calibration of the Lunar Orbiter Laser Altimeter (LOLA) onboard LRO.



NASA's 1.2 meter telescope



NASA's Next Generation SLR system